GIN

Zulu Owners Manual

Thank you for taking the time to read this manual.

Thank you…

Thank you for choosing the Zulu. We are confident that this paraglider will provide you with countless exciting flying experiences. This manual contains all the information you need to fly and maintain your paraglider. A thorough knowledge of your equipment will keep you safe and enable you to maximize your full potential.

Please pass on this manual to the new owner if you do resell your glider.

Happy Flights and Safe Landings,

The GIN Team

Safety Notice

By the purchase of our equipment, you are responsible for being a certified paraglider pilot and you accept all risks inherent with paragliding activities including injury and death. Improper use or misuse of GIN equipment greatly increases these risks. Neither Gin Gliders Inc nor the seller of GIN equipment shall be held liable for personal or third party injuries or damages under any circumstances.

Please note: The Zulu is a DHV class 1-2 glider and it is suitable for use by experienced and qualified pilots or may be used by Pilots under advanced instruction with their school. The Zulu is especially suited to the experienced, frequently flying pilot who will be able to fully benefit from the Zulu's qualities.

If any aspect of the use of our equipment remains unclear, please contact your local paragliding instructor, GIN reseller or the importer in your country.

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1. GIN Gliders

GIN Gliders was formed in 1998 by paraglider designer and competition pilot Gin Seok Song and his team of engineers and test pilots.

Gin's philosophy is simple: to design gliders that he, and any other pilot, will love to fly. This philosophy applies equally for an intermediate glider such as the Zulu, as for the world-beating competition glider, the Boomerang. No glider is released to the market without Gin's complete satisfaction.

Gin has over 15 years' experience of designing and manufacturing paragliders, and is backed up by an equally experienced team, both within the company in Korea and throughout a worldwide network of distributors and dealers. The GIN Team dominated the Paragliding World Cup from 1998 to today and has had countless other competition successes in World Cups, World and National Championships. This high level of expertise provided by dedicated professionals ensures that you get the best possible product support and after sales service.

2. Introducing the Zulu

The Zulu is an intermediate wing built around a completely new concept. It is designed by Gin Seok Song and Robert Graham. They have combined their years of experience to produce a wing that is uniquely in tune with the needs of today's pilots. The Zulu offers outstanding security and top performance combined with precise and dynamic handling. This allows the pilot to accurately feel the sensations of flight, and thus develop an active flying style. Rapid progression up the learning curve is enabled, as the pilot becomes acquainted with the myriad of different movements and moods of the air. The Zulu will allow you to experience the full pleasure of free flight, without ever compromising your safety.

For Pilots Who ...

The Zulu is an ideal all round glider and is suitable for the new pilot who demands easy handling and forgiving wing reactions up to the experienced pilot who flies frequently and wants a fast and high performing glider with a very high safety margin. The Zulu is designed for all kinds of flying, from ridge soaring and your first explorations from your regular hill to regular thermaling, cross country flying and club competitions.

Cutting-edge Design

Gin and Robert have made extensive improvements to the Zulu compared to its predecessor, the successful Oasis. Performance, take-off and handling have been improved with focus on higher passive safety and more forgiving glider characteristics.

Countless prototypes have been built, tested and compared to find the optimum. A new planform, optimized brake layout and a new profile give this wing an incredible safety, superb handling and high stability.

A special feature on the ZULU is the “Keel” that gives the wing it’s characteristic shape. When combined with the optimised line layout these innovations give much higher stability, especially in extreme situations. Inflation of the canopy is easier and it minimizes movements of the wing in turbulent air for your comfort.

The new wingtip shape improves flying characteristics and reduces drag from the tips. These new design elements come directly from our competition glider Boomerang 4 research.

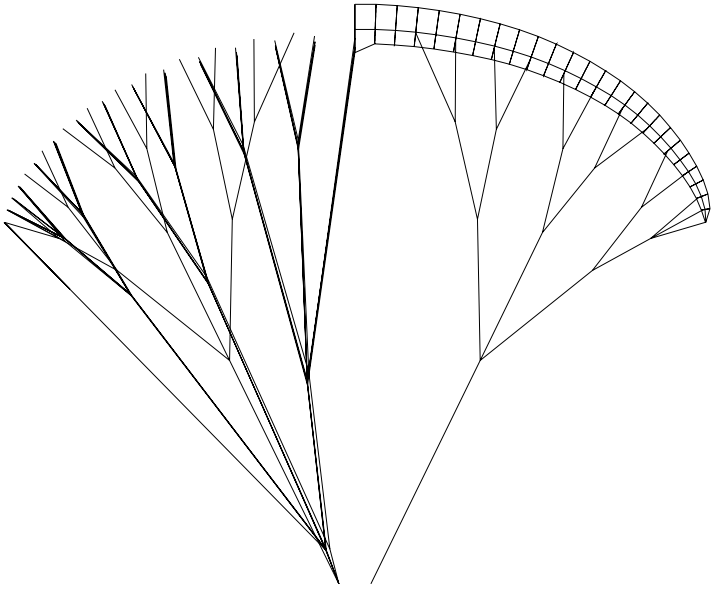
Wind tunnel research and new software to optimize the shape of the leading edge has produced an even cleaner airfoil.

A double reinforcement at the leading edge with an optimised profile has been introduced. This improves take-off characteristics, performance and increases the lifetime of the canopy.

The brake line layout is designed for easy turning, with proportionally increasing brake pressure for precise and direct handling. This enables efficient and easy climbing in thermals as well as using weak lift when ridge soaring.

Weight and drag have been reduced by using a new hi-tech, lightweight fabric and an efficient line layout that reduces the total amount of line.

These and other innovations ensure that by purchasing the Zulu, you are getting the best possible glider in its class.



Manufacturing

All GIN gliders are produced in the company's own facilities using the most modern techniques. Highly skilled staff take extreme care during the entire manufacturing process. Stringent quality control is made after each step, and all materials that go into each wing can be traced. These measures guarantee that pilots fly with the assurance that their wing meets the most exacting safety standards.

3. Before you fly

Pre-delivery Inspection

The Zulu is delivered with speed system, rucksack, inner bag, compression strap, repair tape and this manual. Your instructor or dealer should have made a test inflation followed by a test flight before delivery.

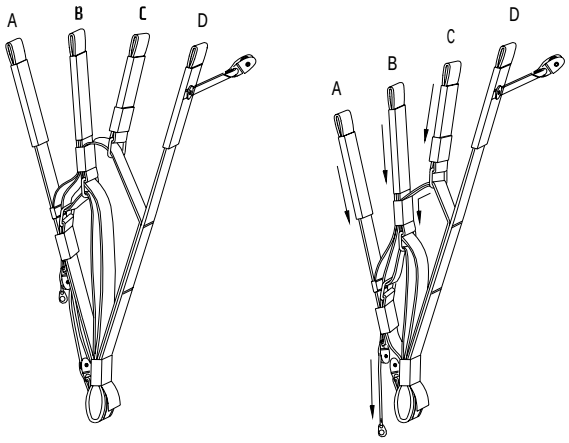
Speed System

The speed system increases the maximum speed by lowering the angle of attack with a pulley-guided, foot-operated system. Up to 12 km/h gain in speed can be realized with the accelerator at full travel.

It is important to have your accelerator system correctly routed through your harness and attached to the risers with the supplied Brummel hooks. The length of the speed bar should be initially adjusted while on the ground, sitting in the harness so that the legs are fully extended at the point of full accelerator travel. It is helpful to have an assistant hold the risers taut while making this adjustment.

Subsequent fine tuning can be done on the ground following the first flight with the speed system. If in doubt about this procedure, consult your instructor or dealer.

Riser	A	B	C	D
length at trim speed	52cm	52cm	52cm	52cm
length at full speed	35.5cm	39cm	45.5cm	52cm

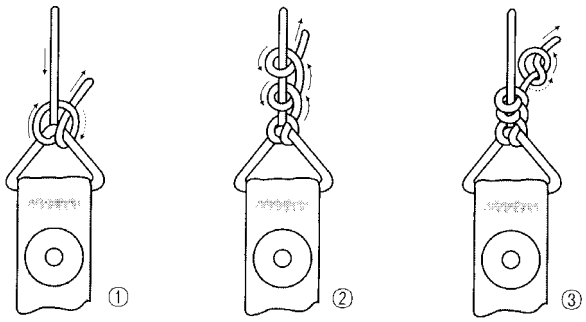


Brake line adjustment

The main brake line lengths of the Zulu are the same as on the sample that has been used for the DHV certification test flights. These line lengths have been fine tuned by GIN test pilots, and it should not be necessary to adjust them.

In soaring flight, it is common to fly with half a wrap on the brakes and hold the handles on the knot. However, care should be taken to release the wraps in any extreme situation.

If you do need to make adjustments to suit your harness, body and flying style, we strongly recommend that you test fly the glider with every 2cm of adjustment. There should be a minimum of 10cm of free brake travel when the glider is flown hands-off. This prevents the brakes being applied unintentionally when the speed system is fully engaged. We recommend a double sheepshank or a bowline knot for the brake handle attachment as shown in the diagram.

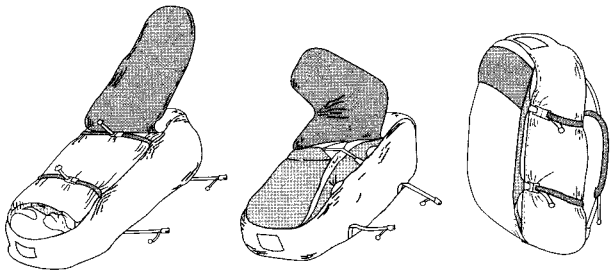


Rucksack

All Gin gliders are delivered with a durable ripstop KODURA® rucksack with 160L capacity. This rucksack is designed for ergonomic carrying comfort and ease of use.

The rucksack should be packed carefully to achieve maximum comfort. First, place the glider inside the harness and then put the top of harness in the bottom of the rucksack with the glider side next to the back of the rucksack. Finally, tighten the internal and external compression straps and adjust the shoulder and waist straps to ensure the equipment stays firmly in place when walking. There are also two storage pockets for accessories.

An XXL rucksack (200L capacity) is available as an optional extra for pilots that require it.



Your harness

The Zulu is certified for use with all harnesses with variable cross-bracing (GH type). Practically all modern harnesses are GH type harnesses. Older harnesses with fixed cross-bracing (GX type) are not certified and should not be used. Check with the manufacturer of the harness or your paragliding instructor if in doubt whether your harness is a GH or GX type harness.

The adjustment of the harness chest strap controls the distance between karabiners and affects the handling and stability of the glider. Tightening the chest strap increases stability but also the risk of twisting after a collapse. With the chest strap in a more closed position the glider also has more tendency to maintain a stable spiral, lengthening of the chest strap gives more feedback from the glider but decreases stability.

Gin calculates and draws the plan of the glider with a distance between the carabiners of 44cm. DHV certification test flights are also carried out with this setting. We recommend setting a distance of 42cm to 50cm between the carabiners, depending on the size and design of the harness. There is no need to fly with a tight chest strap setting with the Zulu, as there is no tendency for it to feel unstable, unlike older gliders.

Certified Weight Range

The Zulu must be flown within the certified weight range given in the reference section of this manual. The weight range is quoted as the total weight in flight, i.e. the weight of the pilot, glider, harness and accessories. The easiest way to check your total weight is to stand on weighing scales with all your equipment packed into your rucksack.

Pre-flight safety

To fly this equipment you should:

- Have appropriate practical and theoretical training and experience for this class of glider.
- Have the necessary insurance and licences.
- Be in your right mind, unaffected by extreme stress, recreational or prescribed drugs.
- Only fly in conditions suitable for your level of paragliding.
- Wear suitable head protection, use a certified harness and emergency parachute.
- Make a thorough pre-flight check.

4. Flying the Zulu

We recommend that you first practice inflating your glider on a small training hill or flat ground. Make your first flights with your new paraglider in gentle conditions on a familiar flying site.

Preparation for launch

Following a consistent method of preparation and pre-flight checks is vital for safe flying. We recommend the following:

- On arrival at the flying site, assess the suitability of the conditions: wind speed and direction, airspace, turbulence and thermal cycles.
- Inspect your glider, harness, reserve handle and pin, helmet and any other equipment.
- Choose a sufficiently large take-off area with even ground and no obstacles.
- Lay the glider out according to the planform, and get the lines and risers sorted out.
- Put your helmet on. Secure yourself in your harness and don't forget the leg loops!
- Connect the risers to your harness carabiners, ensuring there are no twists or loops around the lines.
- Connect the speed system to the risers with the Brummel hooks.
- Do a final line check by pulling gently on the risers or lines to ensure there are no new knots, tangles or interfering branches or rocks. Take extra care in nil or light winds.

Pre-flight check list

- Reserve parachute: pin in and handle secure.
- Helmet and harness buckles closed.
- Lines free.
- Canopy open and into wind.
- Airspace clear.

Take off

The key to a successful launch technique is to practice ground handling on flat ground whenever you can.

Light or Nil Wind Launch

The Zulu inflates steadily in nil-wind conditions. Simply guide the glider with the A-risers, keeping your arms bent and hands at the level of the shoulders. Allow your arms to rise in an arc and wait for the glider to inflate and come above your head - do not push the risers. **There is no need to pull the risers hard.** Run positively as the glider comes above your head. Be sure to look up and **check that the canopy is fully inflated before you take-off**, and that there are no tangles in the lines. If any irregularity should occur and you are not yet airborne, abort the launch immediately by stalling the glider. On steep launches, stall one side of the glider and run parallel to the hill.

If the glider should come up sideways, and the situation is recoverable, run towards the lower side rather than trying to struggle against the force.

An impulse launch where you start running with slack lines close to the glider is not needed.

Strong Wind Launch

The reverse launch technique is recommended. Holding the brakes, turn around to face the wing passing one set of risers over your head as you turn. We suggest building a "wall" by partially inflating your glider on the ground, thus sorting out the lines thoroughly. Check the airspace is clear and gently pull the glider up with the A risers. When the glider is overhead, check it gently with the brakes, turn and launch. In stronger winds, be prepared to take a couple of steps towards the glider as it inflates and rises.

Line knots or tangles

If you do take off with a line knot or tangle, try to get clear of the ground and any traffic before taking corrective action. Weight shift and/or counter brake to the opposite side and pump the knotted side with your brake. Be careful not to fly too slowly to avoid a stall or spin. If the knot or tangle is too tight to pump out, immediately fly to the landing zone and land safely.

Min sink / best glide

The minimum sink speed is achieved by pulling approximately 20 cm of brake. The theoretical best glide speed in calm air is realized at the hands-off position.

Accelerated flight

Once you have become accustomed to flying the Zulu, you can practice using the speed system, which allows improved glide in headwinds and greater penetration in strong winds. When flying accelerated the glider is less stable and the risk of a collapse is higher. Also the glider reacts more radically when a collapse happens during accelerated flight compared to flying at trim speed.

Apply the speed system by pushing the speed bar progressively with your feet. Be prepared to control roll by using weightshift and pitch by varying the amount of bar. Keep a very light pressure on the brakes in order to feel the canopy.

Avoid flying accelerated near the ground, and be careful using the accelerator in turbulence.

If you do encounter a collapse while using the accelerator, immediately step off the bar completely before taking any other corrective actions.

Active flying

The Zulu has a high internal pressure, resistance to tucking and a very high degree of passive safety. However, it is recommended that you always practise an active flying style. This will help you avoid deflations in all but the most turbulent conditions. The key to active piloting is keeping the glider above your head at all times. If it falls back behind you, let up the brakes. If it surges in front of you, counter brake until the surge is controlled.

If you sense a loss of pressure on one side of the canopy, smoothly apply brake and/or weight shift on the appropriate side until you feel pressure return. In all cases, maintain adequate airspeed and avoid overreaction.

In turbulence

Deflations of the canopy can occur in strong turbulence. The Zulu will recover without pilot input in almost all situations, so whenever in doubt, let up the brakes and let the glider fly. Only if the wing surges very fast in front of you should you stop it with the brakes. However, it is recommended that you follow the advice below in order to help the wing recover more rapidly.

Asymmetric deflation

In the event of encountering strong turbulence and suffering an asymmetric deflation (collapse on one side), the Zulu will promptly and easily re-inflate without interference from the pilot, but the wing will turn slightly towards the collapsed side. This might be unwanted close to the ground or other gliders. Maintain your course by weight shifting away from the collapsed side. This action can be aided by applying a little force on the brake opposite to the deflation. This will normally be sufficient for recovery. However, if the deflation fails to come out, pump the deflated side with a firm and smooth pumping motion. Let the glider regain its flying speed after it has re-inflated.

If you have a big collapse - especially when flying fully accelerated - you must observe the following:

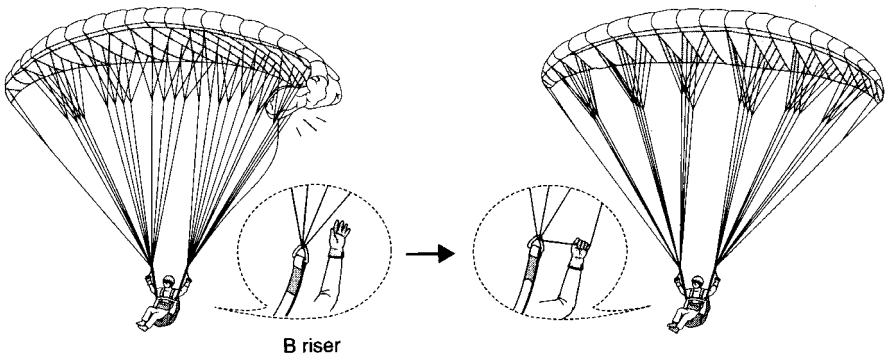
When a big collapse happens, due to the difference in weight and inertia of the canopy and pilot, the pilot will continue to travel forward and the canopy will move behind the pilot at first. You must wait until you pendulum back below the canopy before reacting and carefully counter braking the open side of the canopy. If you react too early or you counter brake too much, you might risk stalling the collapsed canopy.

Symmetric deflation

A symmetric (frontal) deflation will normally reopen promptly by itself without any pilot input. The glider will regain airspeed with a small surge. If counter braking, be careful not to over-correct or to brake too early, when the glider is still behind you - danger of a stall!

Cravat / glider wrapped around lines

A cravat occurs after a severe deflation when the wingtip becomes trapped in the glider lines. It is extremely unlikely to occur on the Zulu but can happen after big deflations or in cascading situations. Nevertheless, the pilot should be familiar with the procedure for correcting it. Counter brake and/or weight shift and pump the brake on the tangled side. On all Gin gliders, there is a separate stabilizer/winglet main line that goes down to the B riser. This line usually becomes slack in the event of a cravat. Pull it down completely until it becomes tight and the cravat normally comes out.



B riser

Flat spin

In normal thermal flight, you are very far from the limits of a flat spin. Nevertheless, should this occur, just let up the brakes immediately and wait for the glider to surge forward, checking it with the brakes if it surges too far. Never release the spin if the glider is far back behind you, always try to release it when it is above or in front of you!

Cascade of events

Many reserve deployments are a result of a cascade of over-corrections by the pilot. Please note that over-corrections are often worse than no input at all.

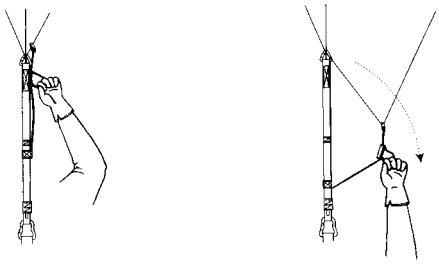
Losing altitude

Extremely strong and widespread lift is found, for example, in storm conditions. The best place to be in this situation is on the ground. Nevertheless, if you have been caught out by the weather and find yourself needing to descend rapidly, there are several ways to do so. The best way is, of course, to find sink. Failing that, try one of the techniques below. Most of these techniques place undue stress on your glider, and should be avoided if you want to extend its lifetime. **We recommend you initially practice these manoeuvres under qualified supervision during a safety training course.**

Big ears

Big ears is a safe method of moderately losing altitude while maintaining some forward speed. Pull in big ears one at a time, using the outer A line on each side. The Zulu is fitted with a "big ears kit" to facilitate this process. Simply pull the red handles velcroed to the risers outwards and downwards as shown.

Although the noise of the wind around your ears may indicate the airspeed increases, the airspeed does not increase by pulling big ears. In fact it decreases by about 5 km/h. You may use the speed bar in combination with big ears to maintain enough forward speed while increasing the sink rate.



The glider can be steered while in big ears using weight shift alone.

When releasing the lines, the Zulu's ears will come out on their own. Release the big ears at least 100m above the ground. If this is not possible, keep the big ears in until you flare for landing rather than letting them out on the approach. This is a safer method because of a possible wind gradient close to the ground and your low airspeed/high wing loading with big ears in.

Spiral dive

The spiral dive should be considered an extreme manoeuvre. Practice spiralling with caution and lower sink rates to get a feeling for the Zulu's behaviour. Weight shift and pull the brake on one side gradually. Let it accelerate for two turns and you will enter the spiral dive. Once in the spiral, your body position will move automatically to the opposite side of the turn. You can control your descent rate and bank angle by applying more or less inner brake. In fast spirals it might be necessary to apply a bit of brake on the outside as well to prevent the outer wingtip from collapsing.

WARNING! A pilot who is dehydrated and/or not accustomed to spiralling can lose consciousness in a steep spiral dive! As with all types of aircraft, we advise you to assist the glider to exit from the spiral dive in a controlled manner. To allow the glider to exit from a spiral dive, your position in the harness must either be neutral, or even better, on the opposite site to the turn while spiralling. If you release the inner brake the wing will normally exit the spiral dive by itself. The Zulu has no tendency to stay in a stable spiral, but nevertheless, you should know how to exit from a stable spiral: Weightshift actively to the outside of the turn and pull the outer brake until you feel the deceleration of the wing and your body moving towards a more upright position. Then, release the outer brake and let the glider decelerate for one or two more turns. Apply a short brake action on the inside brake just before the glider exits the spiral dive completely. This will burn off the remaining energy and avoid a big pendulum moment after exiting the spiral.

We advise you to control the sink rate of the spiral to a maximum of 14 m per second. It is possible to reach a much higher sink rate but the risk of blackout or stable spiral increase proportionally with higher sink.

B-stall

To quickly lose altitude without straining your body with G-force you can use the B-stall. Reach up to the B-risers just below the maillons and twist your hands while gently pulling. It will be difficult at first, but become lighter the more you break the airfoil. Once pulled, do not release immediately. The glider needs to settle into a stable B-stall before releasing. On exiting the B-stall the Zulu has a very gentle dive without deep stall tendencies. We advise you to release the B-stall symmetrically with both hands in a decided manner.

Full stall, dynamic stall

This is an extreme manoeuvre and there should never be any need to perform one.

Do not take wraps with your brakes before entering a full stall. Keep your hands close to your body during the stall, and lock them under your harness seat plate if necessary. In a stable full stall, the canopy will oscillate back and forth. Before releasing the stall, raise your hands slightly and evenly to fill the glider with air. If possible, let the brakes up when the glider is in front of you to avoid excessive surge. The Zulu will slow down the surge on its own, but you may counter brake the dive briefly for comfort if needed and then let up the brakes to regain airspeed. Be careful to not stall the glider again when damping the surge.

Never attempt a stall and then change your mind and release the brakes, as the glider will surge radically.

Deep stall (parachuting, stable stall)

The Zulu does not have a tendency to go into or stay in a deep stall. Should this nevertheless occur, put your hands on the A risers and push forward to gain speed. On some modern harness/accelerator setups, you can reach the speed bar without using your hands. If so, push the speed bar. Never try to steer out of a deep stall. Don't touch the brakes when you are in a deep stall, you will risk stalling the wing completely. If you are very close to the ground you should never try to exit a stable deep stall. The sink rate in a deep stall is normally below the sink rate of a rescue parachute; therefore you should not risk collapsing or stalling the glider near the ground when you are in a deep stall. It is better to hang upright in your harness and prepare for a hard landing, similar to a parachute landing and be ready for a PLF. Don't try to flare before hitting the ground in deep stall!

You can recognise a deep stall by the glider getting "mushy" and the airflow around your ears decreasing. This situation is usually achieved by flying in turbulence or exiting a deflation with too much brakes applied. A wet glider also has a higher deep stall tendency. If you pass through some rain, accelerate a little and never induce big ears in this situation. Stretched lines from hard towing or high fabric porosity can produce a higher deep stall tendency.

Steering without brakes

If a brake is not operational for some reason, you can steer the Zulu with the D-risers. Add steering input by weight-shifting in your harness. Be careful not to steer too much with the riser to avoid any possibility of a spin.

Aerobatics

The Zulu is not designed for aerobatics and in most countries acro flying is forbidden. Besides the inherent risks, extreme manoeuvres of any kind place unnecessary stress on the glider and effectively shorten its lifespan.

Landing with the Zulu

Select a familiar landing area free of obstacles and carefully note the wind speed and direction in the landing area. The low minimum flying speed of the Zulu will help you to make a soft landing in all conditions. Approach the landing with sufficient airspeed and don't leave your last turn too late or too steep.

Before landing, slide your legs forward in the harness so that you adopt the standing position. NEVER land in the seated position; it is very dangerous for your back even if you have back protection, which is only a passive safety system. Standing up before landing is an active safety system, and is much more effective.

Tow launch

The Zulu is suitable and certified for towing by pilots who have the relevant towing rating. The Zulu has no tendencies towards deep stall/parachuting. There is sufficient margin to counter steer the glider in a normal towing situation. Make sure you use proper equipment, experienced personnel, the recommended techniques and all relevant safety precautions for towing.

Motorized flight

Paraglider certification does not include motorized flight. However, motorized flying with the Zulu is possible due to its very easy take-off characteristics, good performance, stability and extraordinarily good handling. Always use certified combinations of paramotor and glider. To know which glider / paramotor combinations have been certified to be used in Germany, check the German Ultralight Association (DULV) web site www.dulv.de

Once the glider has been DULV certified with a certain paramotor it only needs a test flight and application at DULV by the manufacturer of another paramotor (that has already been certified in another combination) to certify this new combination.

5. Care, Maintenance and Repairs

The materials used in the Zulu have been carefully selected for maximum durability. Nevertheless, following the guidelines below will keep your paraglider airworthy and will ensure a long period of continuous safe operation. Excessive wear is caused by careless ground handling and packing, unnecessary exposure to UV light, chemicals, heat and moisture.

Ground handling

The following should be avoided:

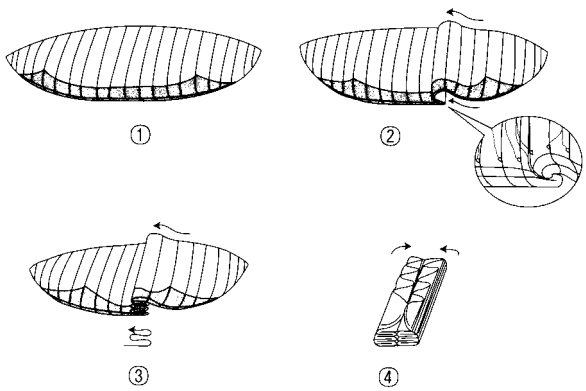
- Violent shocks to the upper surface (e.g. when the canopy crashes to the ground leading edge first whilst ground handling).
- Dragging the glider along the ground.
- Stepping on the lines or canopy. The Kevlar line inside the sheath can take lots of pulling force without stretching, but is sensitive to bending with small radius.
- Opening your wing in strong winds without first untangling the lines.

UV damage

Avoid leaving the glider out in the sun unnecessarily. UV rays from the sun degrade paraglider cloth.

Packing instructions

We advise you to pack the glider “accordion wise” as shown in the drawing. This packing procedure takes slightly longer and is easier to do with an assistant, but it conserves the rigidity in the profile reinforcements.



Since folding the glider weakens the materials, pack the glider as loosely as possible.

Transport and Storage

Moisture is the worst enemy for your glider, adversely affecting the ageing of fabric, lines and reinforcements. The Zulu should therefore be kept dry and cool. Do not pack the glider away for a prolonged period if it is damp, sandy, salty, or if other objects have entered the cells. Always allow it to dry naturally before storage in a dry room. Leave the rucksack zip open whenever possible to allow residual moisture to evaporate, and do not transport or store the glider in the proximity of chemicals such as gasoline, paints or other solvents.

Cleaning

Use only lukewarm water and a soft cloth to clean your wing. Never use any abrasive materials or detergents. Only clean the wing if it is absolutely necessary e.g. after a landing in salt water.

Maintenance Inspections

GIN Gliders recommend that the Zulu is inspected by an authorized Gin agent after every 100 hours flying time or every year, whichever is sooner.

To extend the validity of the DHV certification a full inspection is required after 30 months and then every 24 months thereafter. The maintenance instructions, which can be downloaded from our homepage www.gingliders.com, have to be observed.

A full inspection will give you peace of mind and extend your glider's lifetime. Additional inspections should be performed by a qualified person following a crash or violent landing on the leading edge, or if you note a deterioration of performance or behaviour.

You should also check for any damage to your lines, sail, risers and connectors before each flight.

Repairs

Very small holes in the sail can be repaired with the sticky back tape provided with your glider. Damaged lines should be replaced by your GIN dealer. Before fitting a replacement line, check it for length against its counterpart on the other side of the wing. When a line has been replaced, always inflate the glider on flat ground to check that everything is in order before flying.

Major repairs, such as replacing panels, should only be carried out by the distributor or manufacturer.

6. Reference

Testing and Certification

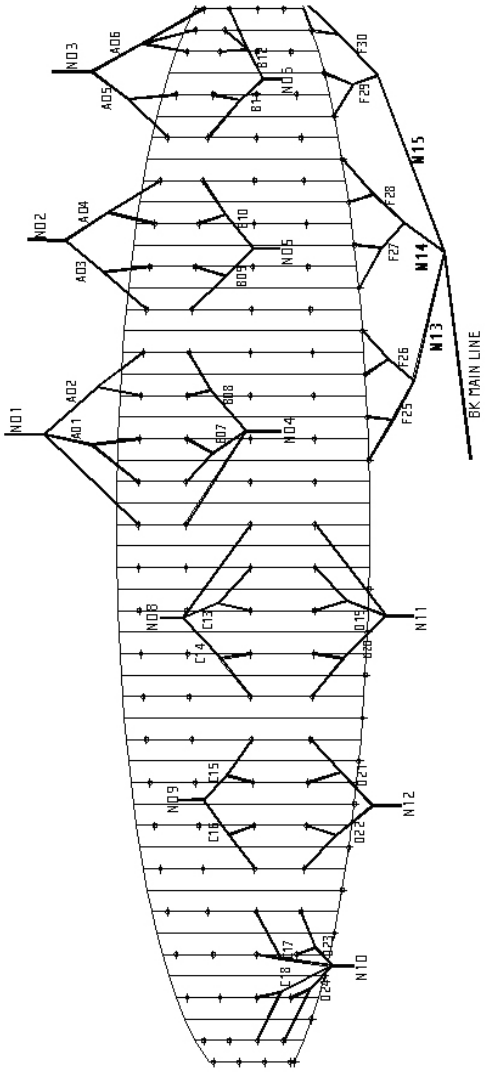
The GIN Zulu has passed DHV 1-2(GH). The Zulu has also passed load and shock tests with a load exceeding 8G of the maximum weight in flight.

Certificate is going to be updated soon

Technical Specifications

SIZE		XS	S	M	L
FLAT	AREA	24.13m²	25.71m²	27.90m²	30.18m²
	SPAN	11.06m	11.42m	11.90m	12.37m
	A.R	5.07	5.07	5.07	5.07
PROJECTED	AREA	20.93m²	22.30m²	24.20m²	26.17m²
	SPAN	8.97	9.25	9.64m	10.03m
	A.R	3.84	3.84	3.84	3.84
CHORD	ROOT	2.79m	2.88m	3.00m	3.12m
	TIP	0.90m	0.93m	0.97m	1.01m
TOTAL HEIGHT		7.10m	7.32m	7.63m	7.94m
CELL NUMBER		50	50	50	50
GLIDER WEIGHT		5.7 kg	6.1 kg	6.5kg	6.9 kg
WEIGHT IN FLIGHT		55~75kg	70~90kg	85~105kg	100~125kg
D.H.V		1-2	1-2	1-2	1-2

Line Plan


N03
A06
A05
B12
B11
N05
F30
F29
N15
N02
A04
A03
B10
B09
N06
F28
F27
N14
N13
N01
A02
A01
B08
B07
N04
F26
F25
BK MAIN LINE
N08
C13
C14
D19
D20
N11
N09
C15
C16
D21
D22
N12
N10
C17
C18
D23
D24

Materials

Canopy Fabric

SUPPLIER	NAME	PORCHER NCV Industries		
	ADDRESS	L'Isle d'Abeau, Parc de Chesnes, 75, rue du Ruisseau 38070 SAINT QUENTIN FALLAVIER Cedex / France		
TYPE OF FINISH		SIDE COATED(POLYURETHANE)		
TYPE OF YARN		PA 6.6 HIGH TENACITY – 33 dtex		
FABRIC CODE		9017 E29A	9017 E38A	9017 E77A
PATTERN		Rip Stop	Rip Stop	Rip Stop
Coated fabric's weight (g/sqm)		40+/-2	40+/-2	40+/-2
Tear Strength	WARP (DaN)	1.5 mini	1.5 mini	1.5 mini
	WEFT (DaN)	1.5 mini	1.5 mini	1.5 mini
Elongation on bias 3 lbs (%)		1 maxi	8 maxi	6.5 maxi
Elongation on bias 5 lbs (%)		2 maxi	17 maxi	2 maxi
Elongation on bias 10 lbs (%)		10 maxi	28 maxi	15 maxi
Break Strength	WARP (DaN/5cm)	38 mini	38 mini	38 mini
	WEFT (DaN/5cm)	33mini	33mini	33mini
AIR Permeability p=2000Pa (l/SQMXMN)		100(maxi)	40maxi	40maxi

Suspension line

MATERIAL		ARAMID(TECHNORA)		
SUPPLIER	NAME	TEIJIN LIMITED, JAPAN		
	ADDRESS	1-1, UCHISAIWAI-CHO 2-CHOME, CHIYODA-KU, TOKYO 100, JAPAN		
DIAMETER(mm)		1.1	1.3	1.6
YARN COUNT		1,000D	1,000D	1,000D
NUMBER OF CORE		4	5	9
BREAKING STRENGTH		80kg	100kg	180kg

Reinforcement

FABRIC CODE		P260 1.0 UVM
SUPPLIER	NAME	DIMENSION-POLYANT Gmbh
	ADDRESS	Speefeld 7 - D-47906 Kempen – GERMANY
MATERIAL		POLYESTER SCRIM
STYLE		P260
FINISH		1.0 UVM
WEIGHT (g/m2)		283
CONSTRUCTION		150P * 150P FILM 150P * 150P

Riser

MATERIAL		POLYERSTER TAPE
SUPPLIER	NAME	Güth & Wolf GmbH
	ADDRESS	Herzebrockerstr. 1-3 D-33330 Gütersloh GERMANY
WEIGHT(GR/M)		34
BREAKING STRENGTH		1,100DAN
WIDTH(mm)		20mm

Maillon

MATERIAL		STAINLESS STEEL
SUPPLIER	NAME	SUBO TECH CO.
	ADDRESS	981-1 CHAGOK-RI PALTAN-GU, HWASUNG-CITY, KYUNG KI-DO, KOREA
WEIGHT(GR)		12
BREAKING STRENGTH		1,000kg
DIAMETER(mm)		4.3

Bridle (Attachement line)

MATERIAL		NYLON
SUPPLIER	NAME	KOLON INDUSTRIAL CO.
	ADDRESS	45 MU KYO DONG JUNG – GU, SEOUL, KOREA
WEIGHT(GR/M)		7.2
BREAKING STRENGTH (kg)		110
WIDTH(mm)		13

Thread

MATERIAL		HIGH TENACITY POLYESTER YARN	
SUPPLIER	NAME	AMANN & SOHNE GMBH & CO.	
	ADDRESS	INDUSTRIESTRASE 1, D-74391 ERLIGHEIM, GERMANY	
DENIER		150D/3	225D/3
BREAKING STRENGTH(EN2062)		2.9kg	3.2kg
ELONGATION AT BRAKE(EN 2062)		16%	16%

"Designing paragliders is a personal journey of challenge and discovery, an ongoing search for perfection."

- Gin Seok Song

Every effort has been made to ensure that the information in this manual is correct, but please remember that it has been produced for guidance only. It should not be used as a "how to fly" manual.
This owner's manual is subject to changes without prior notice. Please check www.gingliders.com for the latest information regarding the Bolero Plus and other GIN products.